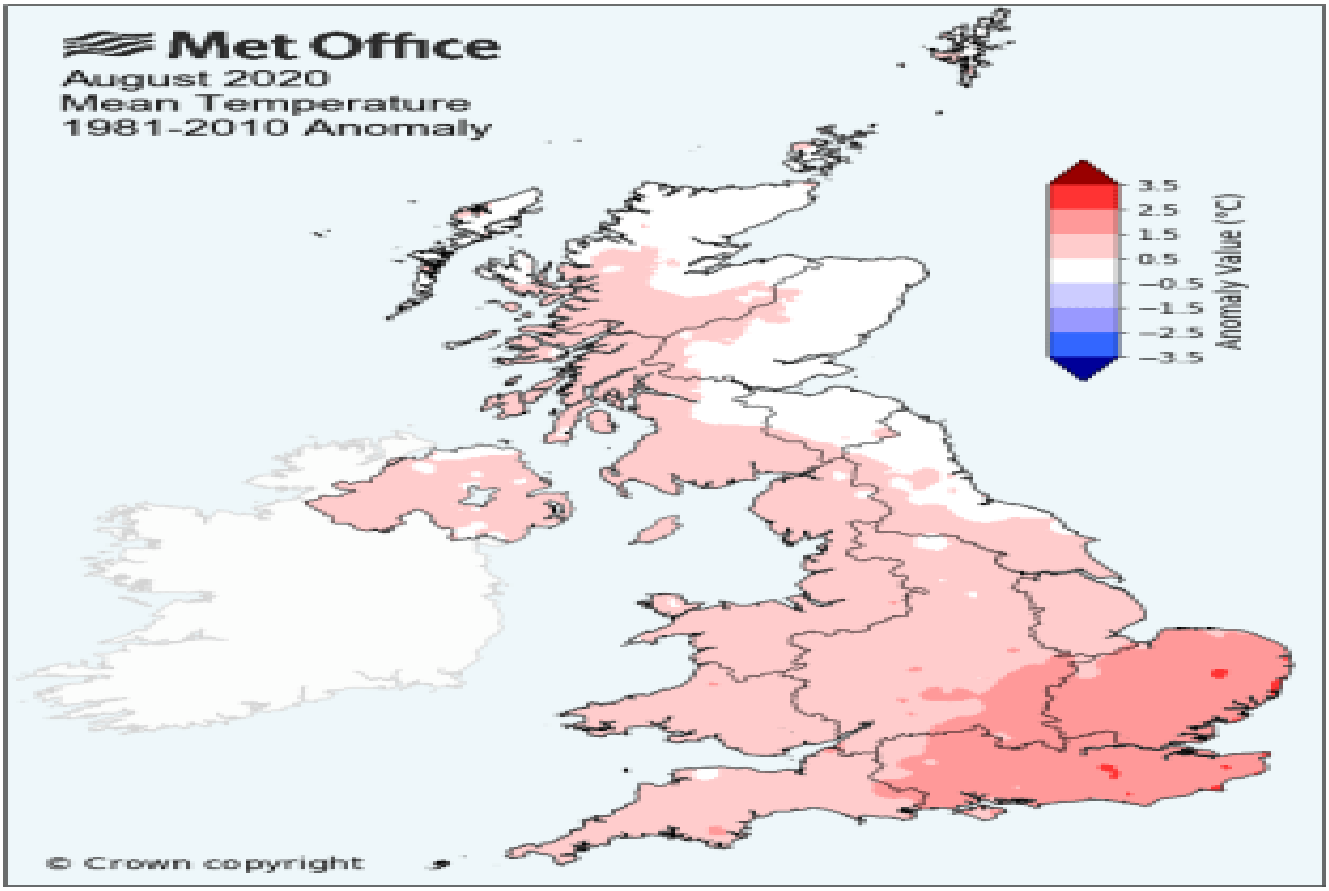
A dull and damp August brings Summer to a close

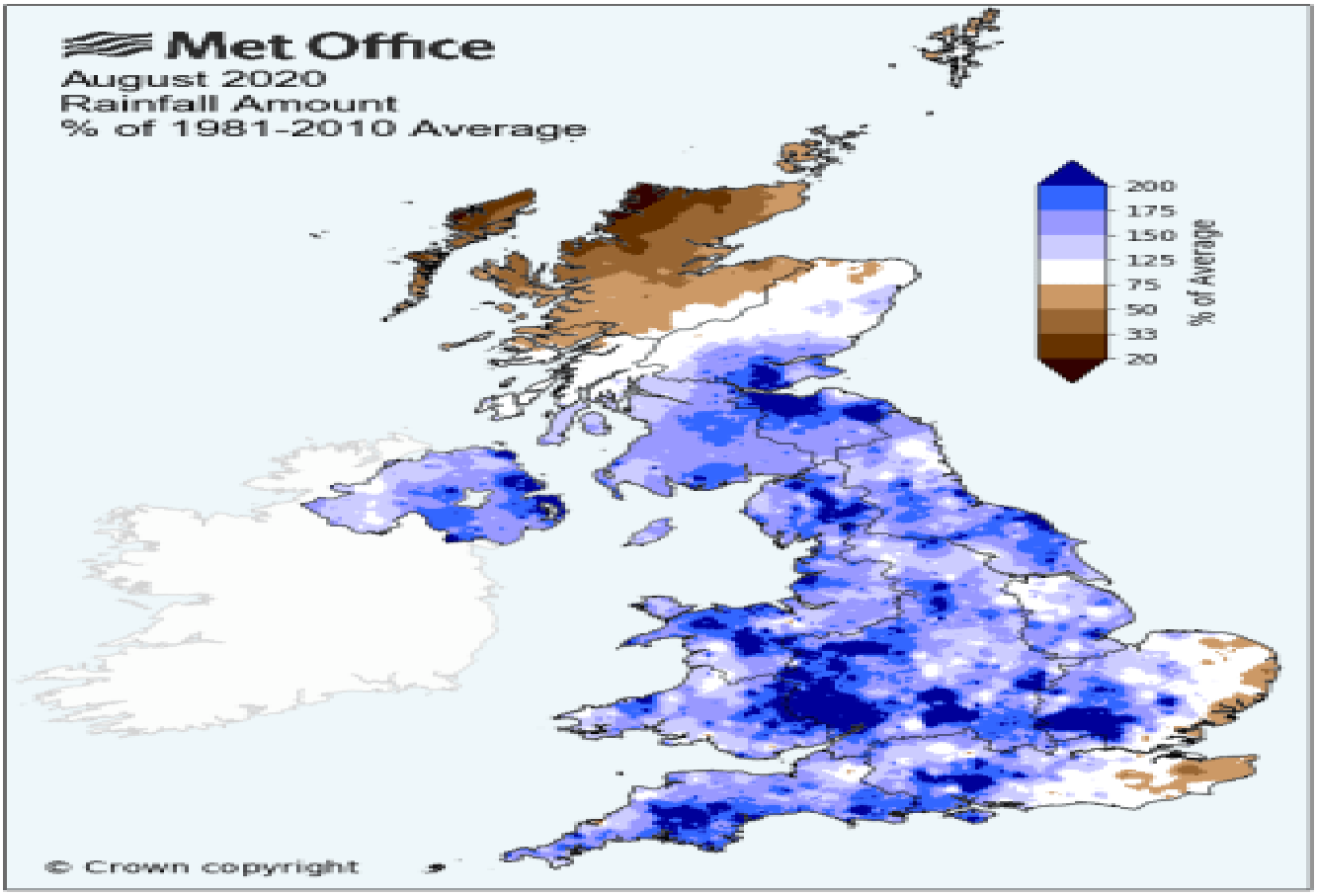
Description

Despite several notable weather events, neither the month of August nor the summer as a whole for 2020 will be remembered for being particularly prominent from a climatological point of view.

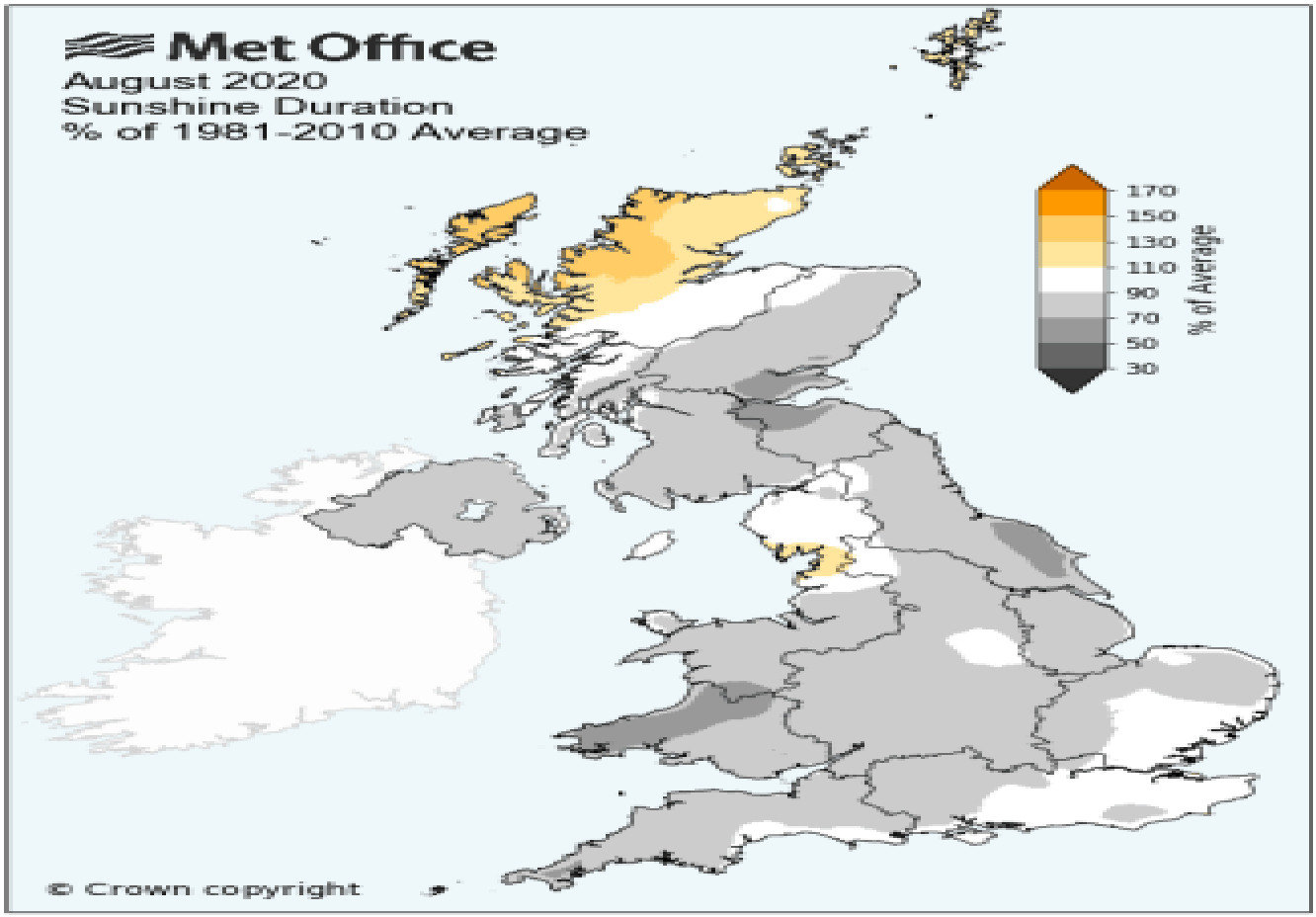
Although there was a major summer heatwave in the middle of the month of August for England and Wales, with temperatures reaching 36.4°C at Heathrow and Kew Gardens on 7th, more unsettled and cooler conditions at the start and end of the month balanced the month out. Much of the UK was above average for mean temperature in August, with East Anglia and the south east of England the highest over the long-term average. Suffolk, Kent and East Sussex were the counties with the highest mean temperatures compared to average (2.5°C above).



It was a wetter than average month for most except for the south east of England and north west Scotland, where Sutherland only recorded 30% of its average monthly rainfall (31.5mm). Some regions recorded more than twice normal August rainfall, Herefordshire recorded 226% of its average for the month and Midlothian 228%. The hot spell of weather triggered some torrential downpours that saw 30-60mm falling in just a few hours, making up considerable proportions of monthly totals in single rain events.



The only region to experience a sunnier than average August was north Scotland, with 119% of its average sunshine hours (139.7 hours). The UK as a whole only saw 88% of its average sunshine hours (142.6 hours).

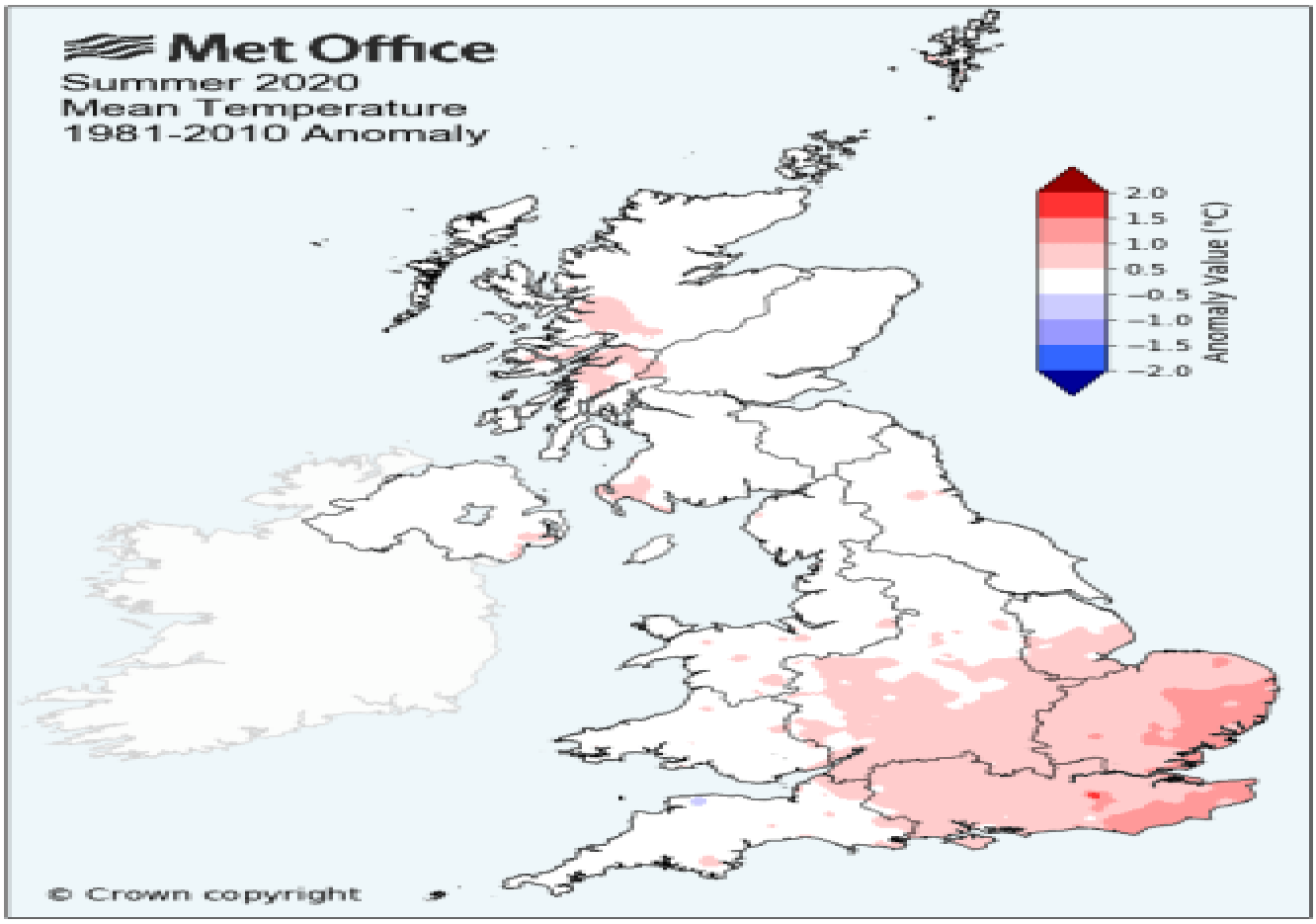


There were two named storms in August in quick succession that brought strong winds and heavy rain to parts of the UK. A turbulent spell of weather late in the month saw a strong jet stream bringing deep areas of low pressure towards the UK. Storms Ellen (19th to 21st) and Francis (25th) brought wind gusts of 46 to 58mph across inland areas and 58 to 70mph across exposed coastal locations. Wind speeds reached 79mph at Capel Curig, Conwy during storm Ellen and 81mph at Needles Old Battery (Isle of Wight) from storm Francis. These were two of the most notable August storms in the UK in the last 50 years but were not unprecedented.

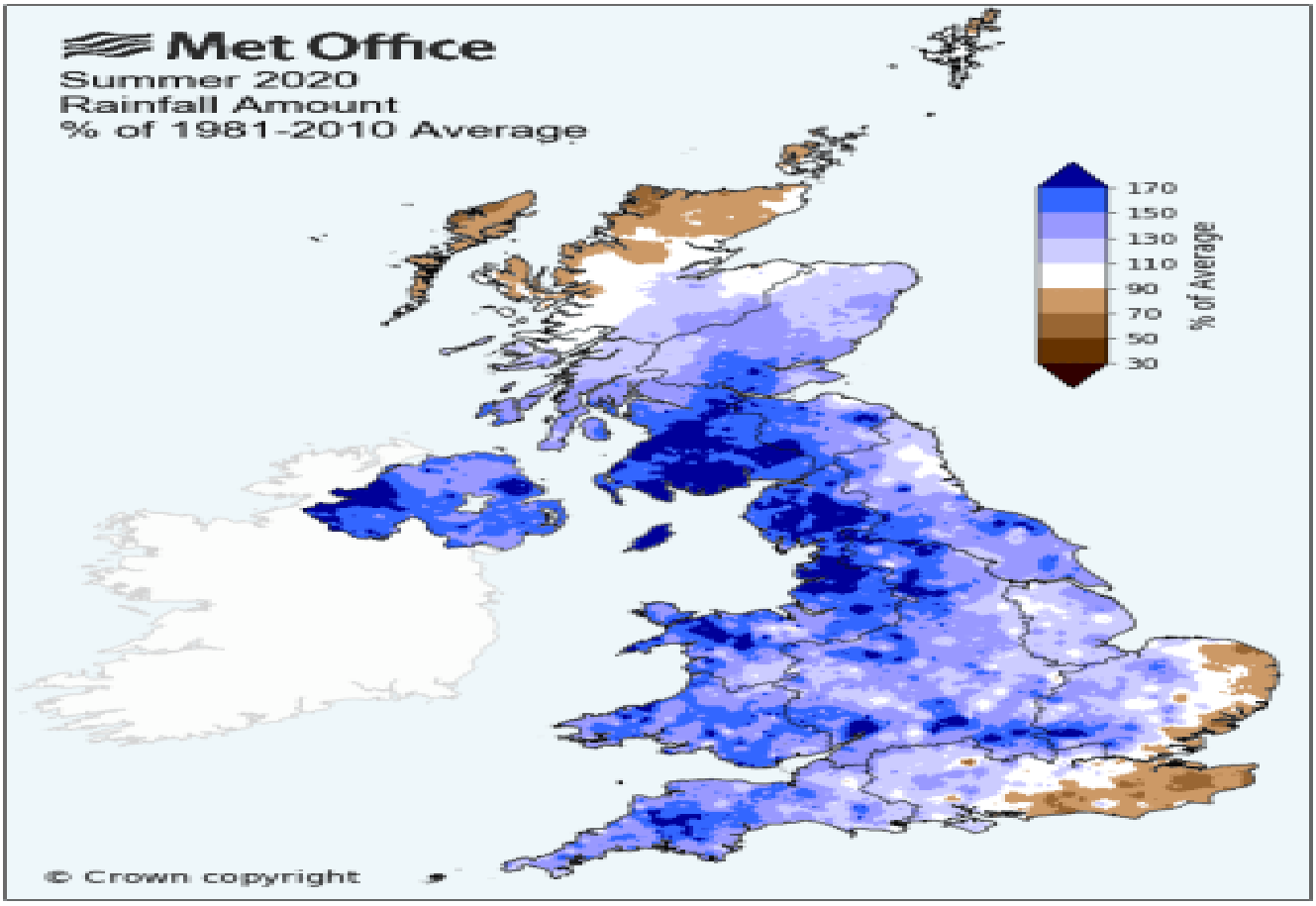
Provisional August 2020 data	Mean temp (°C)		Sunshine (hours)		Rainfall (mm)	
	Actual	Diff from avg (°C)	Actual	% of avg	Actual	% of avg
UK	15.9	1.0	142.6	88	120.0	135
England	17.4	1.3	157.6	86	109.4	158
Wales	16.1	1.1	125.0	74	175.5	163
Scotland	13.5	0.5	128.4	96	116.6	100
N Ireland	15.0	0.6	108.3	80	156.2	161

Summer

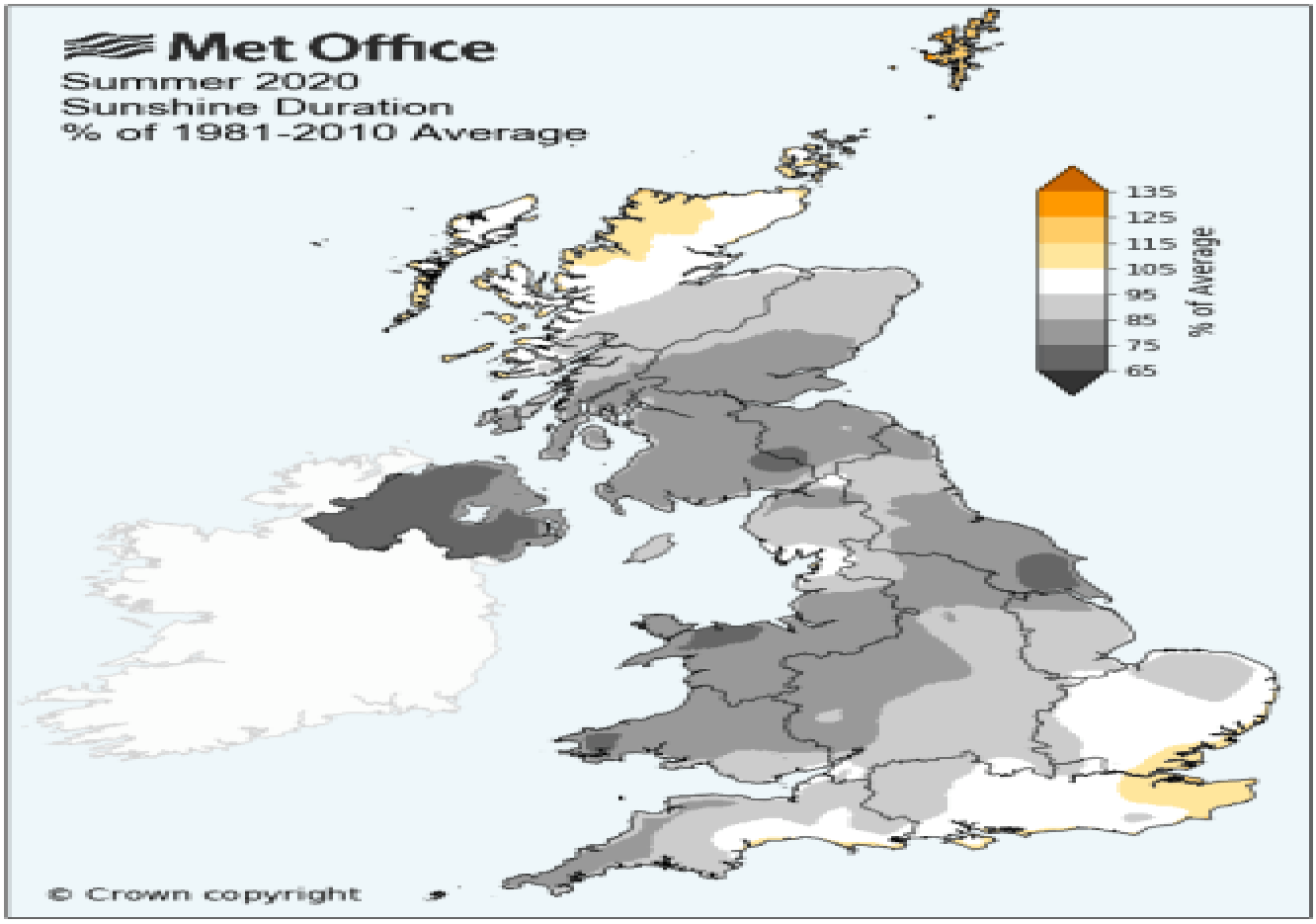
For the season as a whole, the UK has been warmer than average (by 0.38°C), with the focus of above average mean temperatures in the south east of the UK. Warmer conditions in June and August have been partly offset by a cooler than average July. Suffolk had the highest mean temperature compared to average (+1.06°C).‚ County Fermanagh (-0.03°C), Kincardineshire (-0.22°C) and the City of Aberdeen (-0.13°C) were among only five UK counties to be below average for mean temperature through summer 2020.



All three summer months have been wetter than average for the UK, although south east England and north west Scotland are the exceptions when looking at a more local level. Kent was the driest individual county compared to average, with 76% of the average summer rainfall (111.3mm). North west England, south west Scotland and Northern Ireland saw the wettest summer relative to average, with around 150% or more of average rainfall. This year joins a small cluster of years that have experienced a warm-wet summer, where more typically we might expect warm-dry or cool-wet.



Sunshine has been below average in total duration, most notably so for Northern Ireland and Wales. The UK as a whole only had 89% (449.3 hours) of its average summer sunshine, with Northern Ireland only recording 73% (313.9 hours). Only a handful of counties in the south east of England and north Scotland recorded above average sunshine hours for summer 2020.



Provisional Summer 2020 data	Mean temp (°C)		Sunshine (hours)		Rainfall (mm)	
	Actual	Diff from avg (°C)	Actual	% of avg	Actual	% of avg
UK	14.75	0.38	449.3	89	321.0	134
England	16.02	0.53	508.0	91	262.9	136
Wales	14.79	0.34	421.6	81	427.6	150
Scotland	12.78	0.21	383.0	90	374.5	123
N Ireland	14.01	0.11	313.9	73	399.3	157

Date Created
September 2020

Atlantic tropical storms forming at a record pace

Description

Author: Julian Heming, Met Office Tropical Prediction Scientist.

Update 21 Sept 2020

Shortly after publishing the blog below two more storms were named. A low pressure system near Portugal was named Subtropical Storm Alpha, which made landfall later on Friday 18th September. Then the evening of the 18th Tropical Storm Beta formed, this storm is expected to come ashore over Texas soon.

There have now been a total of 23 named storms so far this season and this is the first time Greek names have had to be used in 15 years.

Original blog

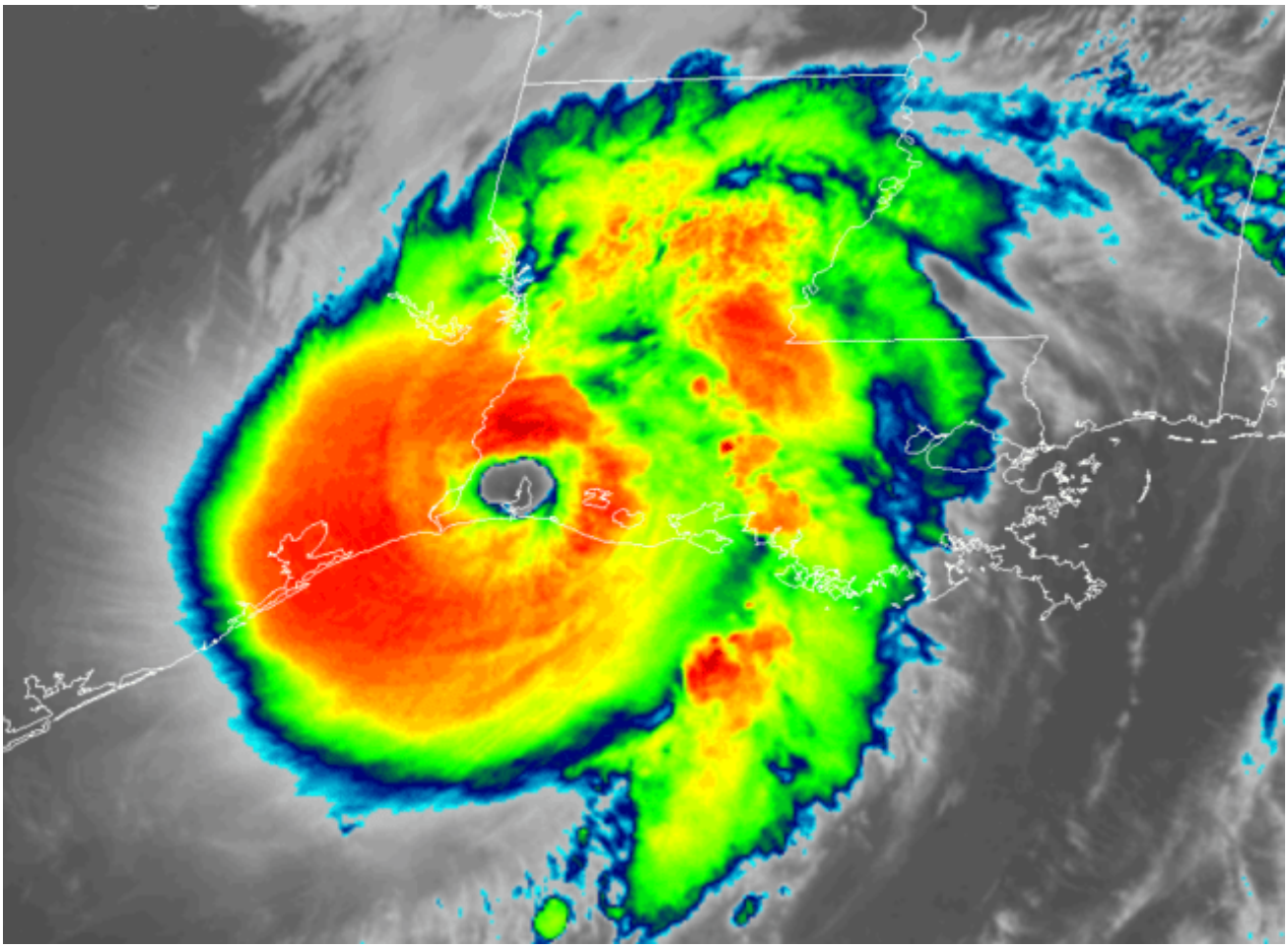
The Atlantic region is currently setting a record-breaking pace for the formation of tropical cyclones. As of 18 September 2020, a total of 21 storms had formed – more than any other year on record at this stage in the June to November season. Only once have more storms been recorded in a season, that was 2005 when there were 28. There are 21 names on the Atlantic storm naming list, when these have been allocated letters from the Greek alphabet are used. Therefore the next storm to be named will be Tropical Storm Alpha. However, that only paints part of the picture of what has been happening in the Atlantic and other parts of the northern hemisphere this year.

Active Atlantic

A combination of several climate factors is driving the active Atlantic storm season this year. A main driver is the development of La Niña conditions in the eastern Pacific, which acts to reduce wind shear over the Atlantic allowing storms to form more readily. High wind shear prevents or slows tropical storm formation. The sea-surface temperatures over large parts of the Atlantic have been higher than average and the west African monsoon has also been strong meaning the easterly waves which cross west Africa and produce Atlantic storms have been potent.

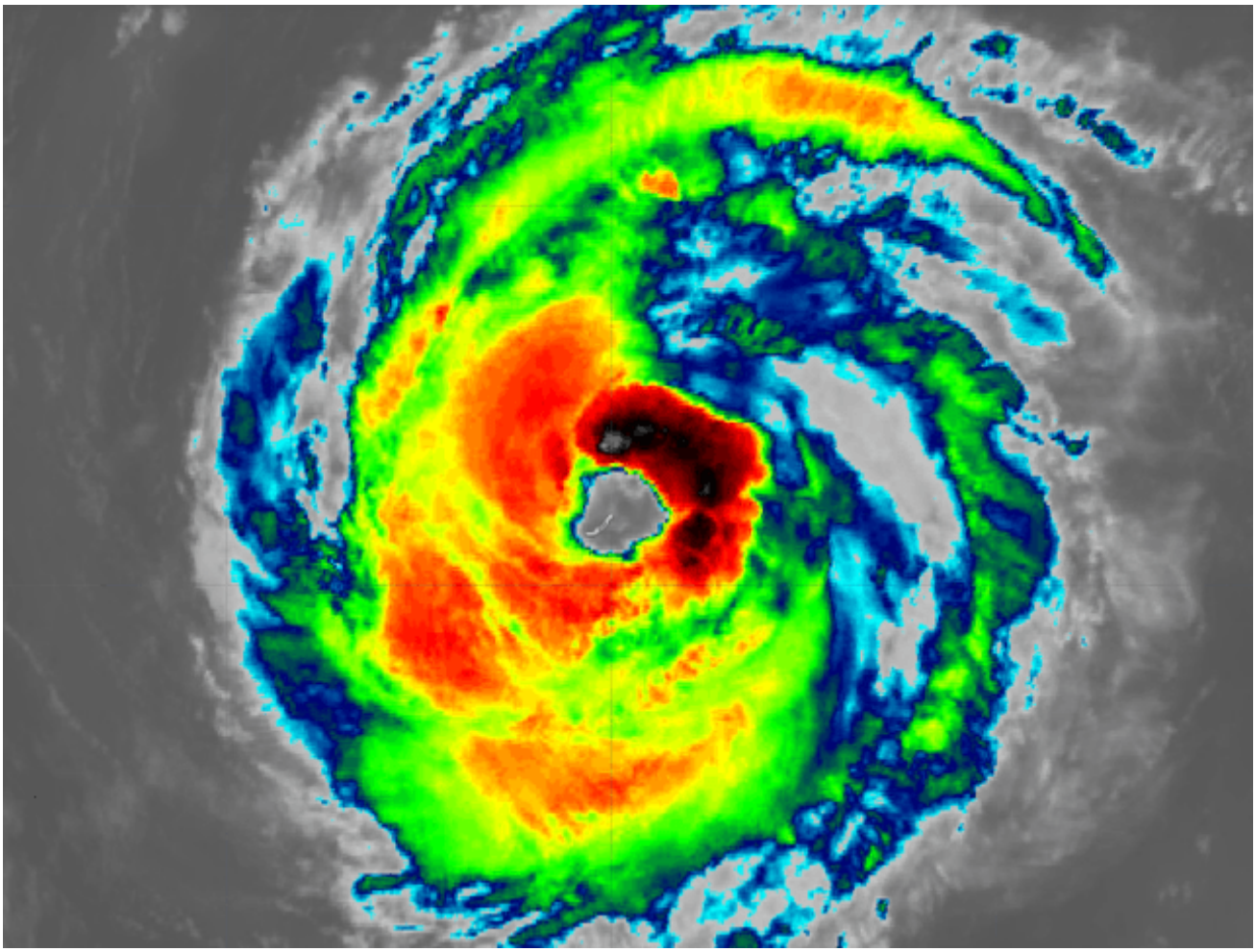
Although there has been a record number of Atlantic storm formations, eight have become hurricanes (winds 74 mph or greater) and just two have become a ‘major’ hurricane (winds 111 mph or greater). This is a lower proportion of hurricanes and major hurricanes than would be expected from a total of 21 tropical storms based on past climate figures. Also, several of this season’s storms were quite short lived, particularly early in the season. Thus, by some measures other than the number of storms, this season has had lower levels of activity than some previous seasons to date.

One feature of the current storm season is the high number of storms reaching landfall over the USA. Tropical Storms Bertha, Cristobal, Fay and Marco and Hurricanes Hanna, Isaias, Laura and Sally have all come ashore over the USA.



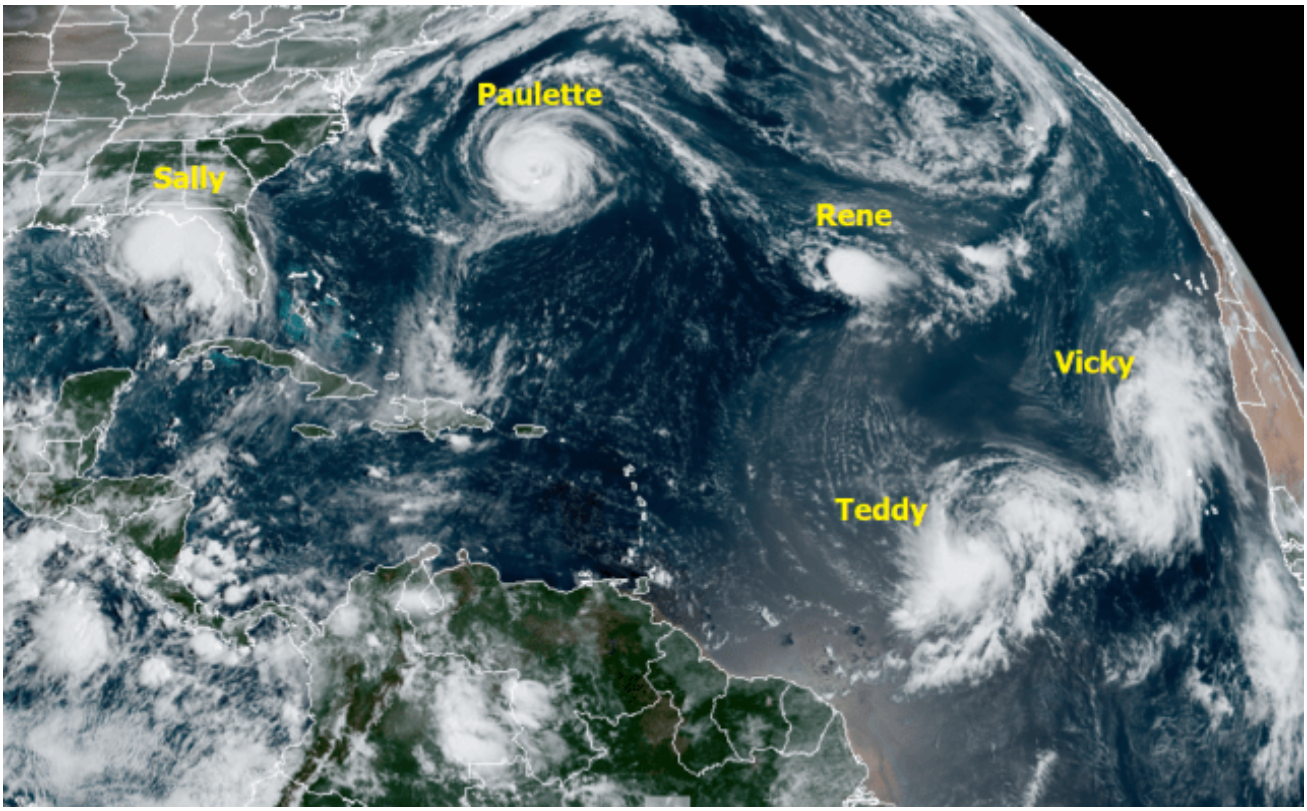
Hurricane Laura at landfall over Louisiana, USA seen on 27 August 2020.
Picture: RAMMB/CIRA.

Hurricane Laura was the strongest of these bringing wind gusts of over 130 mph and a storm surge of near 15 feet at its peak. Although weaker than Laura as measured by wind speed, Hurricane Sally became slow moving at landfall and dropped as much as 30” (750 mm) of rainfall over some parts of southern USA. In addition, Hurricane Paulette made landfall directly over Bermuda in the Atlantic Ocean. This is fourth hurricane landfall over this small Atlantic territory in the last six years.



Hurricane Paulette seen on 14 September 2020.
Bermuda can be seen in the eye of the hurricane. Picture: RAMMB/CIRA.

Meanwhile another tropical depression has formed in the Gulf of Mexico and is expected to become a hurricane over the next few days.



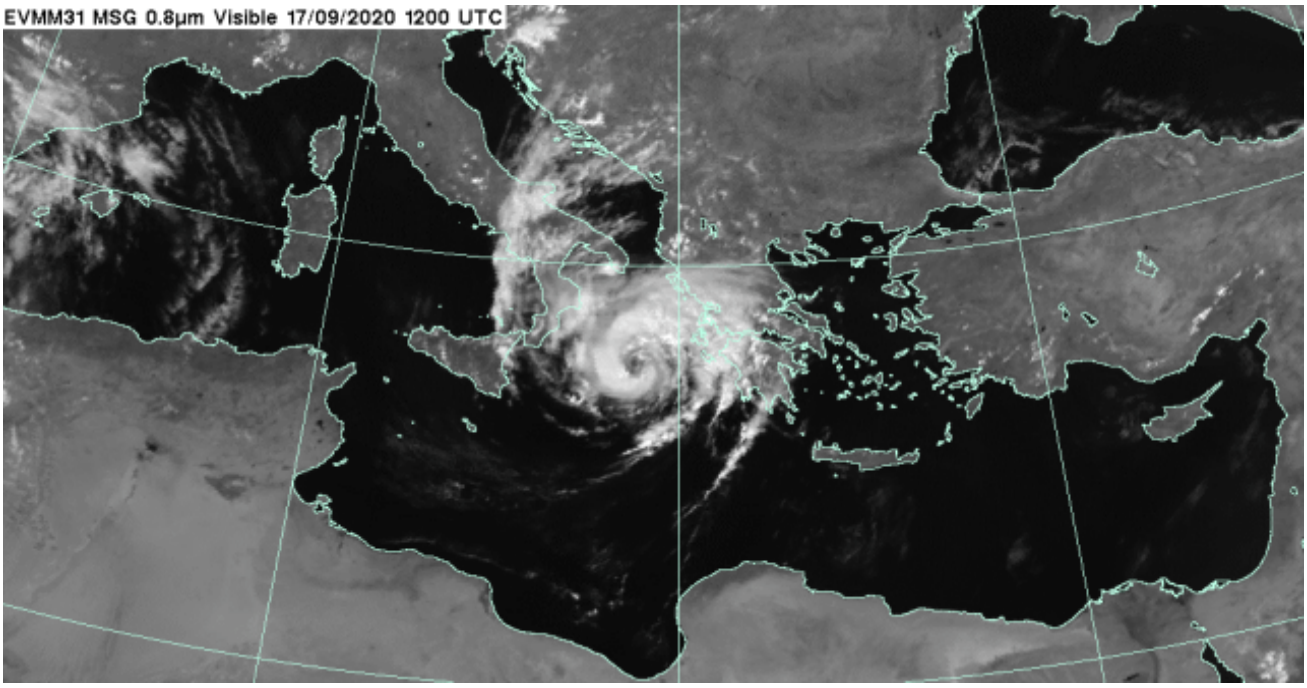
Atlantic tropical cyclones (ranging from tropical depression to hurricane) seen on 14 September 2020. Picture: RAMMB/CIRA.

Elsewhere in the Globe

So have other parts of the globe seen similar levels of activity? In short, the answer is ‘no’. Both the eastern and western Pacific have seen tropical cyclone activity well below average to this point in the season. By one measure, the western Pacific has had only 40% of usual activity. However, some parts of this basin have still been hit hard. Two tropical storms (Hagupit and Jangmi) and three typhoons (Bavi, Maysak and Haishen) have all impacted the Korean Peninsula.

The North Indian Ocean has a split cyclone season and in the first half there were two cyclones. The strongest of these was Amphan which struck the India/Bangladesh border region and to date is the strongest tropical cyclone of the northern hemisphere season.

The Mediterranean Sea occasionally sees storms which have some characteristics of tropical cyclones – sometimes referred to as ‘medicanes’. In 2018 a particularly strong one, known locally as Zorbas, hit southern Greece causing some impacts. A medicane named Ianos, came ashore over the Greek island of Kefalonia overnight 17th to 18th September causing coastal flooding, downing trees and damaging buildings.



Mediterranean storm Ianos seen on 17 September 2020. Picture: Met Office/EUMETSAT.

Is climate change affecting tropical storm intensity and frequency?

The effects of climate change on tropical cyclone activity remains complex. It is not possible to conclusively state the extent to which climate change may have influenced the frequency or intensity of this year's North Atlantic Hurricane season. More research is needed to understand the relationships and relative contributions of the various physical processes at play and the way in which climate change is influencing them.

The Met Office's latest summary of expected changes can be found here and is based largely on the IPCC Fifth Assessment Report.

Further Information

Follow our Twitter feed @metofficestorms for regular information on tropical cyclones currently active worldwide.

Date Created
September 2020

Climate Change: The perfect fuel for wildfires?

Description

As wildfires continue to rage in North and South America, Met Office Chief Scientist Professor Stephen Belcher examines what has led to the potentially record-breaking scale of fires and what science is needed to contain the risks.

California firefighters tackling one of many wildfires which have raged across the eastern United States during 2020. Pic: Shutterstock.

Last year wildfires ravaged Australia. This year has seen reports of extensive fires in the Amazon, in California, and earlier this year during the hot spell, also in the UK. Even the area within the Arctic Circle is experiencing an extraordinary fire season, with thawing permafrost exposing large areas of carbon-rich peatlands, acting as additional fuel and a huge new source of greenhouse gas

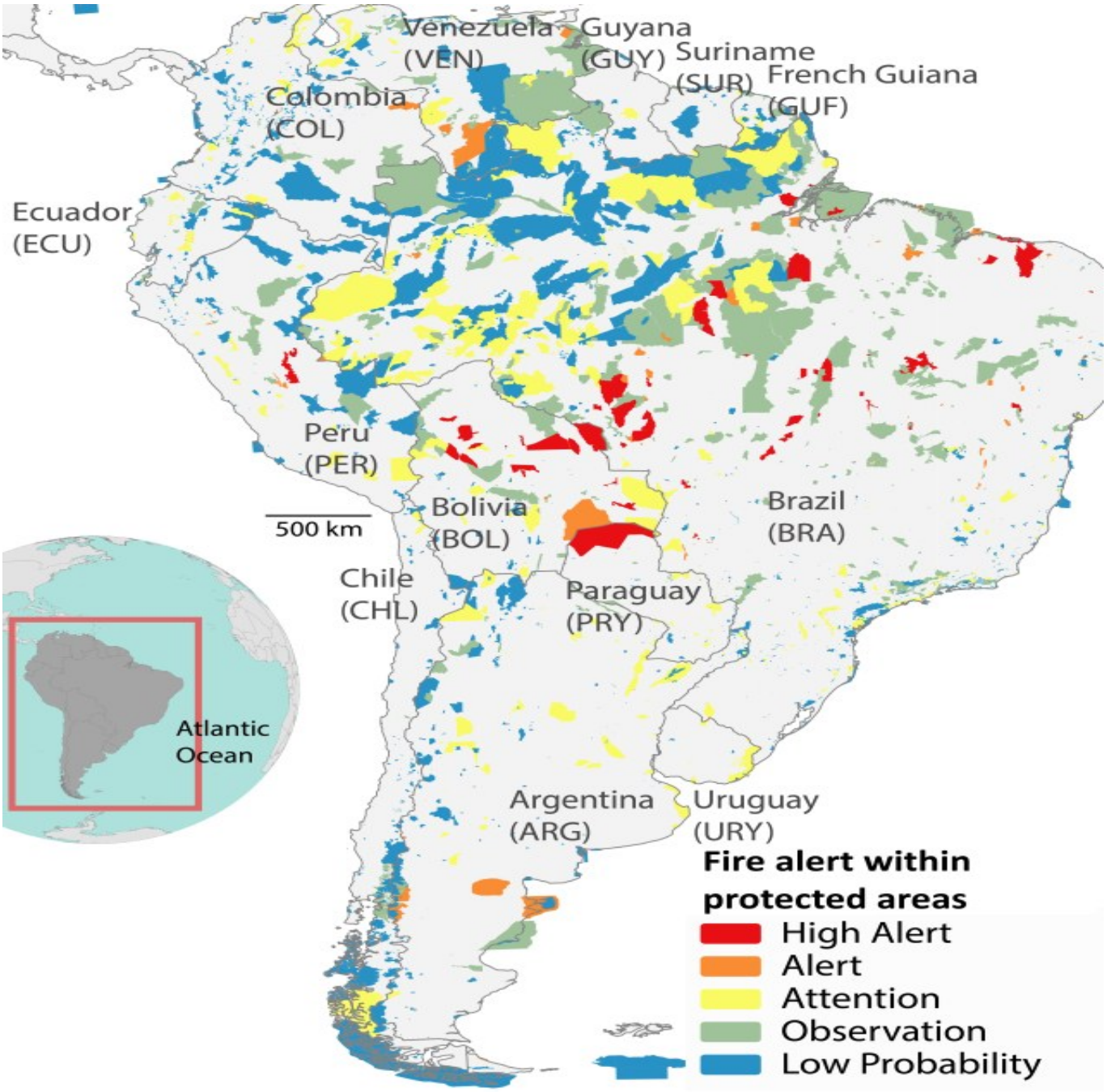
emissions. And it's not just that we are seeing more in the news about wildfires, data shows the number of fires is increasing. By May this year, the number of wildfires recorded in South America was already higher than in any previous year since systematic monitoring began in 1998. And since the early 1970s, California's annual wildfire extent has increased fivefold.

Wildfires are more severe during extended periods of hot dry weather, because higher temperatures cause more evaporation and that dries the vegetation, creating fuel for the fires. For example, last year, Australia saw very hot, dry, conditions caused by a pattern of temperatures in the Indian Ocean, known as the in Indian Ocean Dipole. The Indian Ocean Dipole is a natural fluctuation in the climate that affects the weather patterns around the world including in Australia, but now this fluctuation is adding onto a world that is warmer because of climate change.

So now that the globally-averaged temperature has risen to more than 1.0°C warmer than in the pre-industrial world, it is not surprising that we are seeing more wildfires around the world. Importantly though, higher temperatures alone will not necessarily lead to more fires. Fuel must be available and there needs to be an ignition source, either by human influence or lightning strikes. Climate change may also lead to wetter conditions in some places, as warmer air can hold more moisture, which can affect fuel availability and flammability.

In January this year, an international group of scientists, including from the Met Office, got together to survey the published scientific evidence and concluded there is consistent evidence that hot dry weather conditions promoting wildfires are becoming more severe and widespread due to climate change.

So, we are going to continue to experience more wildfires as the climate changes. This is driving a need to provide forecasts that trigger fire prevention to limit accidental fires. At the Met Office we now produce forecasts of a 'fire severity index' for England and Wales. And earlier this year, scientists from the Met Office and from CEMADEN and INPE in Brazil, developed a technique to assess the likelihood of high fire conditions across South America during the riskier months of August to October. This is part of a broader move from traditional forecasting of weather into forecasting the impacts of weather.



Map of South America showing status of fire alert within protected areas

Chantelle Burton a Climate Scientist at the Met Office who specialises in wildfire research, said: “By using computer simulations of the climate now, with the present-day levels of carbon dioxide, and comparing with computer simulations of the climate with pre-industrial levels of carbon dioxide, we can calculate how climate change has increased the chances of hot weather spells. These techniques are now being extended to calculate the role of climate change in increasing the chances of wildfires.”

Wildfires also pump additional carbon dioxide into the atmosphere, so can act as a ‘positive feedback’. So, as the world warms, we expect more wildfires, that will further warm the climate. Putting numbers on this is a difficult task. Pioneering recent research at the Met Office has combined outputs

from vegetation and climate models, paving the way for future climate projections to include wildfires.

If we are to meet the ambitious Paris Climate Agreement to keep global warming to below 2.0°C degrees above pre-industrial levels, then we must cap our atmospheric carbon dioxide levels. Additional release of carbon dioxide from wildfires reduces yet further the volume of fossil fuels that can be burnt whilst keeping global warming in line with the Paris Agreement. There are other natural processes that are likely to emit additional greenhouse gases into the atmosphere as the climate warms, for example permafrost melting in Siberia. But it’s all about numbers now. A high priority for climate science is to put numbers on these positive feedbacks through better measurements and improved computer models of the climate system so that we can plan for a future that keeps global warming to within the lowest possible limits.

Date Created
September 2020

Storm Alex, so why not Storm Aiden?

Description

Many media outlets have been reporting that ‘Storm Aiden’ will batter Britain with strong winds and heavy rain this weekend.

Over the last few days, weather forecasting computers – known as Numerical Weather Prediction (NWP) models – have been predicting a deep area of low pressure to develop close to the UK this weekend, bringing the potential for severe weather. Chief Meteorologists at the Met Office are closely monitoring developments.

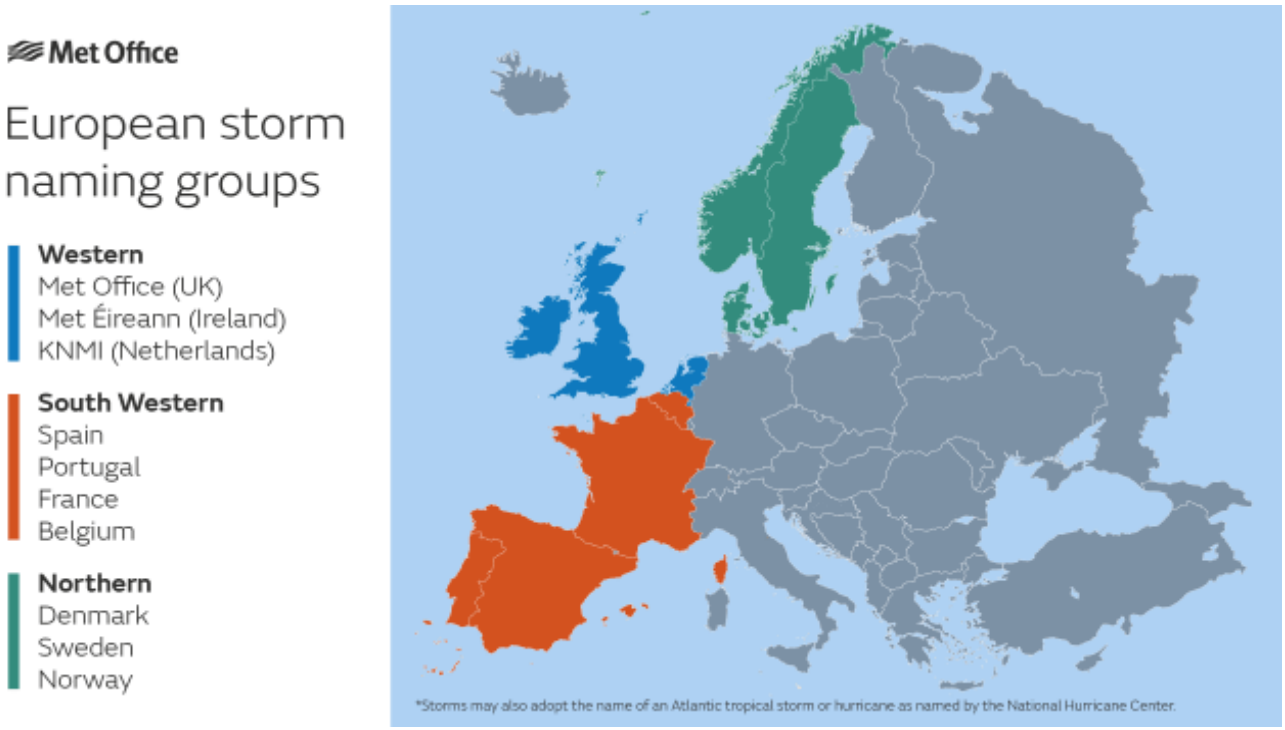
Why do we name storms?

Since 2015 the Met Office, along with Met Éireann and KNMI, the national weather services in Ireland and the Netherlands, have been naming storms based on weather warnings in order to raise awareness of the potential impacts of severe weather.

> https://www.youtube.com/watch?v=l-yFZ0jjmoM
> Why do we name storms?

Latest NWP model output has moved the initial position of this weekend’s low-pressure system further south across France early on Friday. With very strong winds forecast, countries in the south-west Europe naming group – France, Spain, Portugal and Belgium – have named ‘Storm Alex’, which is the first name on their list for 2020-2021. The impacts further north were not considered strong enough for the Western European storm-naming group to name the system as ‘Storm Aiden’.

Later on Friday and over the weekend this system will move closer to the UK, bringing heavy rain and strong winds to many areas.



European Storm naming groups

When a storm is named by another weather service in Europe (see European storm naming groups image above) it is agreed that the same name will be used by all weather services in order to retain a consistent message. Similarly, if a weather system impacting the UK were the remnants of a Hurricane that has moved across the Atlantic, we will use the same name, for example ex-Hurricane Ophelia in 2017.

This weekend, it will be wet and windy for many of us. Keep an eye on the latest Met Office weather forecast and severe weather warnings where you are using our forecast pages and by following us on Twitter and Facebook, as well as using our mobile app.

Date Created
September 2020